

A NEW SPECIES OF *EGGLESTONICHTHYS* (TELEOSTEI: GOBIIDAE) FROM THE INDO-WEST PACIFIC, WITH DISCUSSION OF THE SPECIES OF THE GENUS.

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ABSTRACT

A new species of the gobiid genus *Egglestonichthys* Miller and Wongrat is described from three specimens collected by trawl from the Arafura Sea and Van Diemen Gulf, northern Australia, and off Bombay, India. *Egglestonichthys melanoptera* (Rao), originally assigned to *Callogobius*, is re-described. The new species differs from *E. melanoptera* and *E. patriciae* in having very small eyes, a more narrow gill opening, and distinct brown bands and saddles on a pale background.

KEYWORDS: Gobiidae, Gobiinae, Indo-Pacific, taxonomy, new species, *Callogobius*, *Egglestonichthys*.

INTRODUCTION

In 1977, Northern Territory (NT) Fisheries personnel collected an odd-looking banded gobiid fish from Finke Bay in the Van Diemen Gulf, NT. The junior author recognised it as a possible new genus while examining the NT Fisheries collection in 1978; the specimen was subsequently donated to the Australian Museum.

Further examination of this specimen indicated that the fish belonged in the monotypic genus *Egglestonichthys* Miller and Wongrat, 1979, although differing in having very fleshy sensory papillae raised into ridges around the snout and jaws (as in the genus *Callogobius* Bleeker), fewer lateral line scales and a distinctive colour pattern. A second specimen was eventually found, in 1981, among prawn-trawl by-catch aboard the FV *Anson*, off the Cobourg Peninsula, NT. A third specimen was found among the Zoological Museum, Copenhagen, collection, taken in 1964 south-west of Bombay. Miller and Wongrat (1979: 252) referred to this specimen (as "an undescribed gobiid"), and considered that it was similar to *Egglestonichthys* and *Callogobius* because of its papillose ridges, fine scalation on the head and snout, and enlarged canine teeth, but could be distinguished from either genus by means of its "greatly reduced eyes".

The type of *Callogobius melanoptera* Rao, was suspected to be an *Egglestonichthys*. The putative holotype (ZSI 7919/2) and four other *C. melanoptera* (from New Guinea, the Philippines and Vietnam) were examined and found to belong to a valid species of *Egglestonichthys*, which is here redescribed.

Abbreviations used are: AMS: Australian Museum, Sydney; BMNH: British Museum of Natural History, London; NTM: Museum and Art Gallery of the Northern Territory, Darwin; RUSI: J.L.B. Smith Institute of Ichthyology, Grahamstown; USNM: National Museum of Natural History, Washington; ZMK: Zoological Museum, Copenhagen; ZMUC: Københavns Universitets Zoologisk Museum, Copenhagen; ZSI: Zoological Survey of India, Calcutta; SL: standard length; TRB: transverse scale count backward from anal fin origin; TRF: transverse scale count forward from anal fin origin.

SYSTEMATICS

Egglestonichthys Miller and Wongrat

Egglestonichthys Miller and Wongrat, 1979: 240-242 (type species *E. patriciae* Miller and Wongrat, 1979, by original designation and monotypy).



Fig. 1. *Egglestonichthys bombylios* n.sp., male holotype, NTM S. 10031-016, 45 mm SL.

Egglestonichthys bombylios n. sp.
(Figs 1-3, Table 1)

Type material. HOLOTYPE - NTM S.10031-016, 45 mm SL male, N of Smith Point, NT, 29 m, coll. H.K. Larson on FV *Anson*, 18 October 1981. PARATYPES - AMS I.25055-001, 55 mm SL female, Finke Bay, Van Diemen Gulf, NT, coll. NT Fisheries, 27 October 1977; ZMUC P.781840, 44 mm female, about 26 km SE of Bombay, 12 May 1964.

Diagnosis. A robust goby with very small eyes, upturned mouth and conspicuous colour pattern; second dorsal rays I,9-10; anal rays I,9-10; pectoral rays 20-22; longitudinal scales 31-35; TRB 13-14; head covered with scales, predorsal scales small, extending down to nostrils, opercles scaled, cheeks scaled on upper half; scales on sides of body ctenoid (ctenii deciduous); eyes very small and lateral; interorbital very broad and convex; jaws supraterminal, with outer row of enlarged teeth on lower jaw protruding outside lips; head pores absent; transverse papillae pattern on head, papillae large and fleshy, some rows raised, form-

ing ridges; five broad brown bands or saddles across interorbital, nape and sides, background colour pale whitish or yellowish.

Description. Based on three specimens, 44-55 mm SL. Counts and morphometrics of holotype, if differing from paratypes, indicated by asterisk (in parentheses where necessary).

First dorsal VI*; second dorsal I,9*, I,10; anal I,9*, I,10; pectoral rays 20*-22, segmented caudal rays 17*; caudal ray pattern 9/8*; branched caudal rays 7/6; unsegmented (procurent) caudal rays 7/7 (in one specimen); longitudinal scale count 31*-35; TRB 13*-14; predorsal scale count 30-33 (31*); circum-peduncular scales 18-22*. Gill rakers on outer face of first arch 4+14*, 5+13, 5+16; pterygiophore formula 3-22110 (in all specimens). Vertebrae 10+16 (in all specimens). One epural in holotype, two in Finke Bay paratype; Bombay paratype apparently with two epurals (indistinct in radiograph). Three anal pterygiophores before haemal spine of first caudal vertebra.

Head rounded in cross-section, length 3.1-3.5 (3.3*) in SL. Depth at posterior preopercular margin 1.4-1.5* in HL. Width at posterior preopercular margin 1.2*-1.5 in HL. Mouth supraterminal, oblique, forming an angle of 45-60° with body axis; jaws reaching to below anterior margin or part of eye. Lips smooth, lower lip free only half-way along jaw. Upper jaw 2.3-2.5* in HL. Eye very small, placed laterally and close to snout tip, 8.8-12.8 (9.0*) in HL. Snout broad and short, 3.0-3.3 (3.1*) in HL. Interorbital very broad and convex, 2.1-2.6 (2.5*) in HL. Body robust, compressed posteriorly, depth at anal origin 4.3*-4.6 in SL; body width at origin of first dorsal 6.0-6.3 (6.2*) in SL. Caudal peduncle length 4.2-4.6 (4.5*) in SL. Caudal peduncle depth 8.2*-8.6 in SL.

No mental fraenum; two longitudinal rows of fleshy papillae extending over chin to very edge of lower lip. Anterior nostril a broad, short tube,

Table 1. Meristics of type specimens of *Egglestonichthys bombylios* n. sp.

Character	Holotype	Paratype	Paratype
	NTM S.10031-016	AMS I.25055-001	ZMUC P.781840
Standard length	45	55	44
First dorsal rays	VI	VI	VI
Second dorsal rays	1,9	1,10	1,10
Anal fin rays	1,9	1,10	1,10
Pectoral fin (R/L)	20/21	21/21	22/22
Transv. rows back.	13	14	15?
Trans. rows forward	16	17	?
Lateral line scales	31	35	?
Predorsal scales	30	33	30
Circumped. scales	22	?18	?21
Caud. rays (seg.)	9/8	9/8	9/8
Caud. rays (branch.)	7/6	7/6	7/6

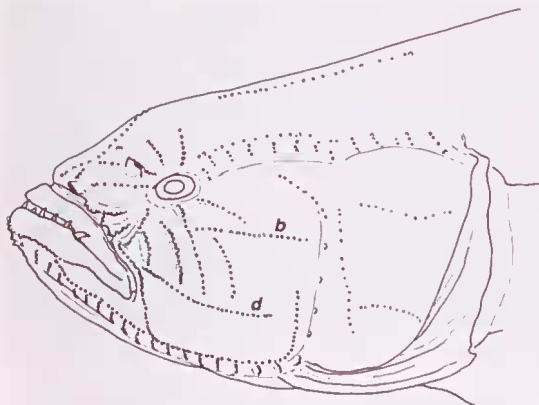


Fig. 2. *Egglestonichthys bombylios* n.sp., holotype, NTM S. 10031-016, showing sensory papillae pattern (scales omitted); sensory papillae rows *b* and *d* are indicated.

close behind upper lip. Posterior nostril a broad slit above and forward of anterior margin of eye. Skin between nostrils naked (some scales present on either side of nostrils). Gill opening narrow, extending forward to under opercle, but not quite reaching to below posterior preopercular margin. Anterior edge of shoulder girdle (cleithrum) smooth. Gill rakers on outer face of first arch without spines, thin and slender, shorter than middle gill filaments; rakers on inner face of first arch short, stubby, with fine spines at tip and partly along inner face, outer rakers on other arches stubby, with fine spines at tips. Tongue blunt to rounded, ZMUC specimen with small notch at centre.

Outer row teeth in upper jaw enlarged, stout and curved; largest three or four teeth on either side of symphysis. Behind outermost row, dense band composed of five to six slender sharp backward-pointing teeth; teeth relatively straight to slightly curved; band of teeth widest toward centre of jaw. Lower jaw with outer row of seven to nine widely-spaced, large stout curved teeth; teeth larger toward sides of jaw; last tooth (at midside of jaw) angled out and backward; outer row teeth all protruding over upper lip when jaws closed. Behind outer row, an even band of two to four rows of small sharp upright teeth. An innermost row of larger, stout teeth; teeth evenly sized and tending to point backward.

Predorsal scales small, cycloid on sides and ctenoid dorsally (ctenii fall off easily; only clearly visible in holotype), reaching forward to between nostrils, ending at level of anterior nostril in largest specimen. Operculum covered with

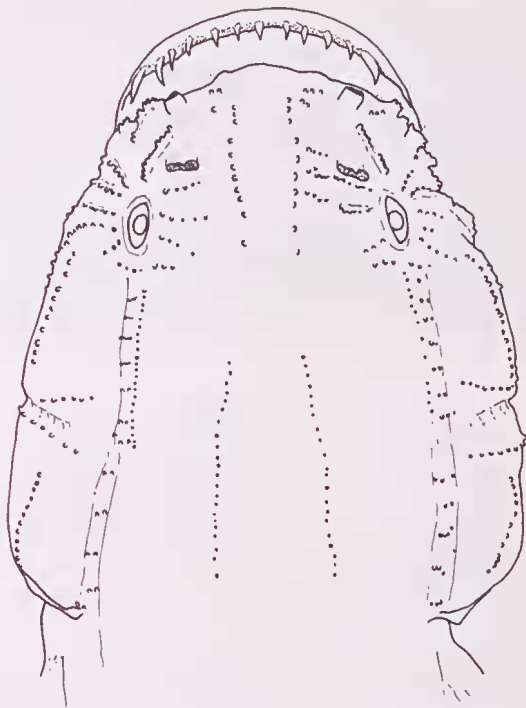


Fig. 3. *Egglestonichthys bombylios* n.sp., holotype, NTM S. 10031-016, dorsal view of head showing papillae (scales omitted).

small cycloid scales. Cheek with cycloid scales behind eye and at least halfway down sides, never extending past papilla row *d*. Pectoral base with cycloid scales. Prepelvic area fully covered with cycloid scales, extending up to insertion of gill membranes. Belly and lower sides of body with cycloid scales. Ctenoid scales (ctenii quite long, but deciduous; largest specimen appearing as though all scales cycloid) on side of body.

Head pores absent, as in other species of the genus.

Sensory papillae pattern on head transverse, as in Figures 2 and 3. Papillae on head fleshy, most papillae slender; papillae on interorbital, jaws and snout areas especially are on raised fleshy ridges.

Genital papilla in male slender, flattened, narrowing slightly toward tip; tip with slender lobe at each side. Genital papilla in females short, bulbous, slightly flattened (may be preservation artefact), without lobes at tip.

First dorsal fin low and relatively rounded, spines barely reaching second dorsal fin origin when fin depressed, depressed dorsal 4.7-6.3* in SL. Second dorsal and anal fins pointed pos-

teriorly, posteriormost rays of these fins not reaching caudal base when depressed. Pectoral fin relatively narrow, pointed, 3.8*-4.2 in SL. Pectoral rays branched, upper and lowermost one or two rays unbranched. Pelvic fins oval, disc-shaped, fraenum thin with margin ragged in holotype (possibly damaged); length 4.3*-5.1 in SL. Caudal fin narrow and short, rear edge rounded, 3.5-3.9 (3.6*) in SL.

Colouration of fresh material. No notes were taken when the holotype was collected, but the senior author recalls it as being pale yellowish, with dark brown bands.

Colouration of preserved material. Based on the holotype and larger AMS paratype, as these specimens still have their skin fairly intact. The colour pattern superficially resembles that of the stargazer, *Ichthyoscopus fasciatus*.

Background colour whitish, with six brown saddles and bars crossing back; first bar across eyes and sixth around caudal base. Anteriormost brown bar crossing from eye to eye, extending halfway down cheek; dorsally, bar not much greater than eye width in holotype, anterior margin curving forward to last few scales on snout in paratype (no brown colour on areas between anterior and posterior nostrils). Second bar or saddle crossing nape above opercle, width of saddle equals width of upper part of opercle, bar ending halfway down opercle on both specimens. Third saddle crossing back at first dorsal fin base, saddle width equal to base of fin; saddle narrowing and ending at level of mid-pectoral base. Fourth saddle crossing back below second dorsal fin (closer to rear of fin than to origin); saddle not narrowing ventrally but ending at about mid-side of body. Fifth and sixth bars encircling caudal peduncle, both bars close together and joined by mid-lateral brown stripe (one scale wide); sixth bar crossing caudal fin base at posterior edge of hypural and fifth bar about three scale widths anterior to it.

First dorsal fin plain dark brown, with relatively unpigmented distal margin. Second dorsal fin whitish anteriorly, most of fin dark brown (an extension of fourth saddle); posteriormost two rays and their membranes unpigmented. Caudal, anal, pectoral and pelvic whitish to translucent.

Distribution. Coastal waters of northern Australia ("Top End" of the Northern Territory) and western India (off Bombay).

Ecology. The NT specimens were trawled from soft mud substrates (banana-prawn grounds) in 2-29 m depths.

Remarks. All specimens are slightly the worse for wear after being trawled. The holotype is in the best condition; it is the only specimen with intact sensory papillae. The ZMUC specimen has had its skin badly abraded; Miller and Wongrat apparently thought it resembled a *Callogobius* in having an oculoscapular canal (which the specimen lacks).

Etymology. *Bombylios*: the Greek word for "bumblebee" (masculine), which this species resembles in colour pattern and (less so) in its robust body shape.

Egglestonichthys melanopectera (Rao)
(Figs 4-5, Table 2)

Callogobius melanopectera Rao, 1971: 44-45 (Godavari estuary).

Material examined. Holotype of *Callogobius melanopectera*: ZS1 7919/2, female, creek, Godavari estuary, coll. V.V. Rao. USNM 263565, 88 mm SL female, Carigara Bay, Samar Sea, Philippines, 50-70 m, coll. C. Ferraris, February 1980; RUS1 17279, 2 females (68-83), Vietnam, coll. P. Fourmanoir, 20 January 1964; AMS I.35825-001, 83 mm female, Orokolo Bay, Gulf of Papua, Papua New Guinea, coll. P.N.G. Department of Primary Industry, 25 September 1976.

Diagnosis. A relatively large goby with elongate, pointed black fins and plain dark brown head and body; second dorsal rays 1,10; anal rays 1,8-9; pectoral rays 21-22; pelvic fins fused but fraenum absent; longitudinal scales 35-45; TRB 12-14; head covered with scales, predorsal scales small, extending down to nostrils, opercles scaled, cheeks fully scaled; scales on body and most of head ctenoid (ctenii deciduous); eyes large, placed dorsolaterally; jaws nearly supra-terminal, oblique, with outer row teeth protruding outside lips; head pores absent; transverse papillae pattern on head, papillae large and fleshy.

Description. Based on five specimens, 68-88 mm SL.

First dorsal VI; second dorsal 1,10; anal 1,8-9; pectoral rays 20-22, segmented caudal rays 17; caudal ray pattern 9/8; branched caudal rays 8/7; unsegmented (procurrent) caudal rays 7/6 (in one specimen); longitudinal scale count 35-45; TRB 12-14; predorsal scale count 29-37; circumpeduncular scales 14-16. Gill rakers on outer face of first arch 3+15 (in two specimens), 5+15 (in one), 5+16 (in one). Pterygiophore formula 3-22110 (in three). Vertebrae 10+16

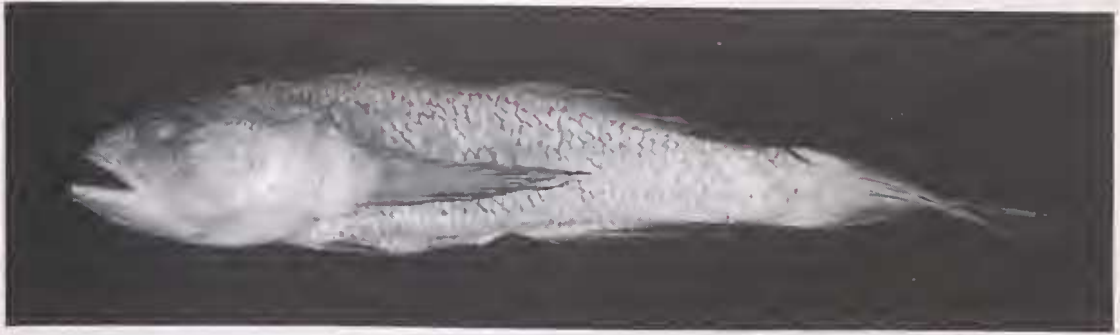


Fig. 4. *Egglestonichthys melanoptera*, AMS 1.35825-001, 83 mm SL female.

(in three). One epural (in three). Two (in two) or one (in one) anal pterygiophores before haemal spine of first caudal vertebra.

Head rounded to almost square in cross-section, length 3.3-3.7 in SL, with broad cheek. Head depth at posterior preopercular margin 1.4-1.6 in HL. Head width at posterior preopercular margin 1.2-1.4 in HL. Mouth nearly supraterminal, oblique, forming an angle of 45-60° with body axis; jaws reaching to below mid-eye. Lips narrow, smooth, lower lip free just past half length of jaw. Upper jaw 2.0-2.2 in HL. Eye large, rounded, placed dorsolaterally (more dorsal than lateral), 3.8-4.5 in HL. Snout short, with pronounced knob in midline formed by ascending processes of premaxillae, 3.9-4.3 in HL. Interorbital moderately broad and flat, 4.9-5.9 in HL. Body rather compressed (possibly exaggerated by damage), depth at anal origin 4.4-4.9 in SL; body width at origin of first dorsal 6.3-9.4 in SL. Caudal peduncle length 3.9-4.5 in SL. Caudal peduncle narrow, depth 5.8-9.2 in SL.

No mental fraenum; two longitudinal rows of papillae extending over chin to very edge of lower lip. Anterior nostril a broad, short tube,

close behind upper lip. Posterior nostril a broad slit (low rim may be present, although variably squashed in specimens examined) close to anterior margin of eye. Skin between nostrils naked (some scales present on either side). Gill opening wide, extending forward to below posterior margin of eye. Anterior edge of eleuthrum (shoulder girdle) smooth. Gill rakers on outer face of first arch with stout spines along inner face, rakers relatively thin and slender, shorter than gill filaments; rakers on inner face of first arch short, stout, with spines at tip and along inner face, outer rakers on other arches similar, with spines at tips. Tongue blunt in three specimens, or rounded (in one).

Outer row teeth in upper jaw enlarged, stout, curved and relatively widely spaced; largest teeth toward front of jaw; teeth protruding outside lips when mouth closed. Behind outermost row, two to four rows of small sharp teeth, and an innermost row composed of larger sharp backward-pointing teeth; this inner row variably developed, most obvious at front of jaw. Lower jaw with outer row of widely-spaced, large stout curved teeth along front half of jaw only; teeth protruding over upper lip when jaws closed.

Table 2. Meristics of specimens of *Egglestonichthys melanoptera*.

Character	Holotype ZSI 7919/2	AMS 1.35825-001	DPI Kanudi (uncat.)	USNM 263565	RUSI 17279	RUSI 17279
SL	65	83	84	88	68	83
First dorsal	VI	VI	VI	VI	VI	VI
Second dorsal	1,10	1,10	1,10	1,10	1,10	1,10
Anal	1,9	1,9	1,9	1,8	1,9	1,9
Pect. fin (R/L)	22/-	20/21	20/21	21/21	21/22	22/21
TRB	-	12	14	14	14	14
TRF	-	14	15	17	16	16
Lateral line	?35	40	41	45	35	35
Pred. scales	-	29	32	37	?31	32
Circum. sc.	-	15	18	14	16	15
Caud. (seg.)	17	9/8	9/8	9/8	9/8	9/8
Caud. (br.)	-	8/7	8/7	8/7	8/7	8/7

Behind outer row, an even band of four or five rows of small sharp upright teeth. An innermost row present of larger, stout curved teeth; teeth very similar in size and shape to outermost row, but tending to be evenly sized and all pointing backward.

Body scales ctenoid (most scales lost and remainder with most ctenii fallen off). Predorsal scales not much smaller than body scales, mostly ctenoid, reaching forward past nostrils, ending just behind upper lip; scales cycloid from level of posterior nostril forward. Operculum covered with scales (few remaining scales ctenoid). Cheek completely covered with scales, some scales ctenoid (remainder appear cycloid, but probably due to loss of ctenii); scales extending down past corner of mouth. Pectoral base fully scaled (scales lost, therefore unable to determine if cycloid or ctenoid). Prepelvic area fully scaled (scales lost), anteriorly to gill membranes insertion, and posteriorly to pelvic ray bases. Belly fully scaled (scales lost).

Head pores absent, as in other species of the genus.

Sensory papillae pattern on head transverse, as in Figure 5. Papillae on head fleshy, most papillae slender (difficult to see due to trawl damage).

Female genital papilla quite bulbous, with two lobes on either side of tip; papilla of probable male (Papua New Guinea) specimen conical, slightly flattened, no lobes at tip visible.

First dorsal fin pointed, second to fourth spines longest, spines reaching third or fifth second dorsal fin elements when fin depressed, depressed dorsal 3.7-3.8 in SL. Second dorsal and anal fins pointed posteriorly, posteriormost rays of these fins not quite reaching caudal base when depressed. Pectoral fin long and narrow, pointed, reaching past anal fin origin, 2.4-2.8 in SL. Pectoral fin with uppermost and lowermost rays unbranched. Pelvic fins somewhat pointed, forming flat disc (membrane joining fifth rays broken in all specimens, but present and undoubtedly continuous), fraenum absent with no remnant present on base; length 3.2-4.2 in SL. Caudal fin long, narrow and pointed, longest rays in centre of fin; 1.8-2.0 in SL.

Coloration of fresh material. No information available.

Coloration of preserved material. All specimens have variably damaged skin; the Papua New Guinea specimen being in the best condition. Fish appear to be plain dark brown all over



Fig. 5. *Egglestonichthys melanoptera*, AMS I.35825-001, 83 mm SL female, head papillae pattern (specimen abraded, some papillae probably missing).

head and body, darkest dorsally. All fins black to dark brown; pelvics lighter brown than other fins.

Distribution and ecology. Known so far only from the Godavari estuary, eastern India (this river has many mouths); Vietnam (no details available); the Samar Sea, Philippines (the Samar Sea is virtually enclosed by the islands of Samar, Leyte and Masbate); and Orokolo Bay, Gulf of Papua, Papua New Guinea.

Remarks. From the junior author's notes and the original description, the holotype has a narrower gill opening than other specimens examined (extending to below preopercular edge, not to rear of eye).

This species looks rather like *E. patriciae*, but the pelvic fraenum is completely absent. Winterbottom and Burrige (1992) indicate that the lack of fraenum is usual (but not a constant) in species of *Priolepis*.

Egglestonichthys patriciae Miller and Wongrat

Egglestonichthys patriciae Miller and Wongrat, 1979: 242-246 (South China Sea).

Remarks. Miller and Wongrat's 1979 original description is fairly detailed but does not give any transverse (or circumpeduncular) scale row counts (approximately 14 TRB rows are visible on their drawing on p.245). Winterbottom and Burrige's (1992) description of this species was based largely on Miller and Wongrat, as the holotype (and only known specimen) has been alizarin-stained and partly dissected, with the left half of the jaw, suspensorium, pectoral base and pectoral fin missing.

Material examined. Holotype of *Egglestonichthys patriciae*: BMNH 1979.4.25.1, 47 mm

SL male, about 325 km SE of Hong Kong, Granton trawl over muddy sand, 79 m depth, 3 April 1967.

DISCUSSION

Winterbottom and Burrige (1992) consider *Egglestonichthys* as a sister-group to *Priolepis* or possibly a group which included genera such as *Trimma*, *Trimmatom* and *Paratrimma*. This suggestion was based on these genera all sharing the characters of: absence of lateral canals and pores on the head, possession of a wide gill-opening extending forward to below the rear margin of the preopercle, vertical dark-margined bars often present on the head and body (*Egglestonichthys bombylios* and *E. patriciae* have some dark barring, but all available specimens of *E. melanoptera* appear to be plain blackish), and denticles present on the inner face of the gill rakers on the outer face of the first gill arch. The last character is given as an apomorphy for the genus *Priolepis* by Winterbottom and Burrige (1989). However, these tiny spines on the first arch rakers may be found in some small commensal gobiines such as *Bryaninops* (Larson 1985), some species of *Pleurosicya* and *Lobulogobius* (Larson and Hoese 1980; Larson 1990), at least one species of the shrimp commensal *Amblyeleotris*, and eventually may be found in other taxa upon further examination. Within *Egglestonichthys*, there is variation in gill raker spination, as the spines are absent in *E. bombylios* but present in *E. melanoptera* and *E. patriciae* (the latter with one spicule only on the first raker, according to Winterbottom and Burrige 1992). Winterbottom and Burrige (1989) refer to the small species *Aphia minuta* possibly having spines on the first gill arch, based on an illustration. Northern Territory Museum specimens of this species (from Plymouth, England) have no spines on the first arch rakers (however, the specimens do have the gill filaments reduced considerably on the lower limb of the first arch, so that the filaments look as though they have been artificially trimmed, which may be a useful character in diagnosing the genus).

Pelvic fin fraenum and fin form varies among the three species of *Egglestonichthys*: *E. patriciae* has a distinct fraenum, *E. bombylios* has a very thin one and *E. melanoptera* has none. *Priolepis* species often have no fraenum (Winterbottom and Burrige 1992).

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